

## The analysis of life histories: illustrations of the use of life history plots

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Veröffentlichungsversion / Published Version  
Sammelwerksbeitrag / collection article

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### Empfohlene Zitierung / Suggested Citation:

Müller, W. (1980). The analysis of life histories: illustrations of the use of life history plots. In J. M. Clubb, & E. K. Scheuch (Eds.), *Historical social research : the use of historical and process-produced data* (pp. 164-191). Stuttgart: Klett-Cotta. <https://nbn-resolving.org/urn:nbn:de:0168-ssoar-326496>

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The Analysis of Life Histories:  
Illustrations of the Use of Life History Plots\*

In the last few years analysis of life histories has been rediscovered as a sociological problem area from a variety of different perspectives. For a long time the classical study of Thomas and Znaniecki had found successors in a strict sense almost exclusively in Poland, where for the analysis of mostly written biographies special methodological tools (the biographical method) were developed<sup>1</sup>. Beside this, sociology mainly relied on anthropological traditions in dealing with the social construction and definition of different phases of the life cycle and the problems arising in the transition from one phase to the next<sup>2</sup>. In this tradition particular attention was given to childhood, youth and old age on the one hand, and to the family life cycle on the other hand<sup>3</sup>.

\* The plot routines, which are used in this paper, were first developed in the Nuffield Mobility Project of Oxford University in cooperation with B. H. S. Liénard, C. M. Llewellyn and John H. Goldthorpe. B. H. S. Liénard kindly made available to the author a version of the program implemented at Oxford and explained the details of the program structure. This program served as a model for the development of our own program which fits the particular structure of our life history data and the requirements of the CALCOMP plotter of the University of Mannheim. The Mannheim version corresponds in all essential characteristics to the Oxford version and makes use of some additional information. In cooperation with the author Gerhard Kolb of the Mannheim University computer center wrote the program. I wish to express my heartfelt thanks in particular, to B. H. S. Liénard and Gerhard Kolb, but also to Joan Kirchmeier who translated the text into English.

The paper forms a part of work being done in the SPES-Project of the Socio-Political Research Group at the universities of Frankfurt/Mannheim which is financed by the German Science Foundation.

<sup>1</sup> Thomas, William J., and Znaniecki, Florian, *The Polish Peasant in Europe and America*, New York 1919–1921.

<sup>2</sup> Eisenstadt, Samuel N., *From Generation to Generation: Age Groups and Social Structure*, Glencoe/Ill. 1956.

<sup>3</sup> Haller, Max, *Lebenszyklus und Familientheorie*. Bericht über das 8. Internationale Family Research Seminar in Paris 1973, in: *Kölner Zeitschrift für Soziologie und Sozialpsychologie*, 26 (1974), pp. 148–166; König, René, *Soziologie der Familie*, in: König, René (ed.), *Handbuch*

It is hardly possible to bring the newly awakened interest in *life histories* onto a common denominator. However, common to most approaches is the observation that the standard methodology of empirical sociology in examining human existence in society on the basis of synchronic designs and cross-sectional data is unsatisfactory in many regards. Behavior and consciousness had to be regarded as the result of past life experience, and could therefore be explained only in the light of this process. A criticism of this kind particularly underlies symbolic interactionism and phenomenological analyses of the ‚Lebenswelt‘. With reference to this, for instance, Kohli explains crisis phenomena in mid-life as the result of anomic tensions between aspirations developed in the course of life and increasingly felt structural constraints which prevent these aspirations from being realized<sup>4</sup>.

But even authors who are not committed to this tradition have lately been stressing much more the importance of life-long experience and the need to include it in sociological research. Thus Bahrdt<sup>5</sup> gives special precedence to the study of life histories mainly for the analysis of consciousness structures among members of the lower classes, arguing that in these classes the relating of events constitutes the original form of reflection. „The articulation form used by members of lower-classes, including workers, when they reflect on their own situation . . . is the related story, the anecdotic account of their personal life history, especially of their childhood and youth.“<sup>6</sup> In accordance with this, Osterland<sup>7</sup> regards the investigation of sociobiographies as a decisive instrument with which to reconstruct the (political) socialization process and to analyze consciousness structures. That such analyses are bound up with a practically unsolvable problem is pointed out by Osterland himself. An unbiased picture cannot be portrayed, for „the individual perspective is always bound up with subsequent harmonization of conflicts, legitimation of decisions, repression and rationalization processes“<sup>8</sup>.

Leaving aside such difficult analyses of the genesis of consciousness structures, chiefly English authors consider the structure of life experiences to be a fundamen-

der empirischen Sozialforschung, Vol. 7, 2nd. ed., Stuttgart 1977.

Life cycle perspectives can clearly also be found in different traditions of psychology, be it in the psycho-analytical school, in development psychology or the newly expanding field of ‚life-span developmental psychology‘, where the questions of life-long personality development and the conceptualization of developmental phases and developmental crises prevail. Cf., e. g., Bühler, Charlotte, *Der menschliche Lebenslauf als psychologisches Problem*, Göttingen 1933; Erikson, E., *Identity, Youth and Crisis*, New York 1968; Nesselroade, John R., and Reese, Hayne W. (eds.), *Life-Span Development Psychology. Methodological Issues*, New York and London 1973.

<sup>4</sup> Kohli, Martin, *Lebenslauf und Lebensmitte*, in: *Kölner Zeitschrift für Soziologie und Sozialpsychologie*, 29 (1977), pp. 625–656.

<sup>5</sup> Bahrdt, Hans Paul, *Erzählte Lebensgeschichte von Arbeitern*, in: Osterland, Martin (ed.), *Arbeitssituation, Lebenslage und Konfliktpotential*, Frankfurt 1975.

<sup>6</sup> Op. cit., p. 14.

<sup>7</sup> Osterland, Martin, *Lebensgeschichtliche Erfahrung und gesellschaftliches Bewußtsein*, in: *Soziale Welt*, 24 (1973), pp. 409–417.

<sup>8</sup> Op. cit., p. 413.

tal factor in class-forming processes. Basically, the discussion here centers around the questions, in what way, to what extent and which types of intergenerational and intragenerational mobility processes can explain the evolution of class orientation or the absence of such orientation<sup>9</sup>. Particularly Goldthorpe/Llewellyn have made clear that only a differentiated investigation of life *histories* can make a profitable contribution to the study of class-forming processes<sup>10</sup>.

The present paper, however, is not concerned primarily with theoretical problems. The intention here is merely to present a methodical instrument which appears especially suitable for the description and analysis of life histories.

Life courses are processes which progress according to defined structures. In examining them, we aim to find out both the mode and extent to which they are structured, and the influencing factors more adequately and differentiatedly than everyday observations and common sense statements allow. Sociology's fundamental interest in life histories is rooted in the question of how the biological processes of growing up, maturing, aging and dying are linked with the „division du travail social“ and role allocations. An abundance of different solutions are conceivable and do in fact exist. The extent to which societies are stratified according to age was, it is true, regarded by e. g. Smith as an important criterion in distinguishing traditional and modern societies<sup>11</sup>. But even in modern societies not only familiar delimitations of specific groups of the population according to age and connected delimitations of life phases prove the relevance of age structures. The institutional affiliations of individuals and the transition processes between central institutions are clearly structured according to age, thus for example, the more or less total rooting in and subsequent withdrawal from the family of origin, the transition into educational institutions and from there into the occupational system, etc. In the occupational system biographical sequences are institutionalized in the form of professional careers which at least correlate with age.

There are time-tables which reflect social norms as to when certain events or role change should take place. But these time-tables do not as a rule display sharp dividing lines with general applicability. This is true at most for a few legal definitions such as the age of majority which, however, interestingly enough is of no particular significance for the subjective experience of life. In fact, it is merely an empirical question to determine how life courses are actually structured in relation to time;

<sup>9</sup> See Giddens, Anthony, *The Class Structure of the Advanced Societies*, London 1973; Goldthorpe, John H., *Mobilité sociale et intérêts sociaux*, in: *Sociologie et Sociétés*, 8 (1976), pp. 7–36; Goldthorpe, John H., and Llewellyn, Catriona, *Class Mobility in Modern Britain: Three Theses Examined*, in: *Sociology*, 11 (1977), pp. 257–287.

<sup>10</sup> Goldthorpe, John H., and Llewellyn, Catriona, *Class Mobility: Intergenerational and Work-life Patterns*, in: *The British Journal of Sociology*, 28 (1977), pp. 270–302. See also Bahrdt, *Lebensgeschichte*, and Bertaux, Daniel, *Mobilité sociale biographique: Une critique de l'approche transversale*, in: *Revue Française de Sociologie*, 15 (1974), pp. 329–362.

<sup>11</sup> Smith, Michael G., *Pre-Industrial Stratification Systems*, in: Smelser, Neil J., and Lipset, Seymour M. (eds.), *Social Structure and Mobility in Economic Development*, Chicago 1966.

what are typical sequences and how strongly they are adhered to; what is the duration of single phases of sequences; in what way different sequences are co-ordinated; how the fact of being too early or late in one sequence influences the course of another sequence; whether delays are made up for or a premature advantage disappears with time. In addition, a wide field of questions concerns itself with the differences in life patterns in various population segments of the social structure<sup>12</sup>.

It must be emphasized that age as such is not regarded here in any way as a causal variable. It is social norms which make age in some ways appear to be a good indicator variable. These social norms are linked partly explicitly with age, but partly only implicitly on account of the fact that certain sequences are normed. Both explicit norms and regularities which result from particular sequences (e. g. from replacement processes) can change with time. In analytical models it should therefore be ensured that this variation in time can be accounted for.

From these reflections arise a number of requirements which must be borne in mind when analyzing life histories. The first problem lies in the fact that we are dealing with longitudinal data. These cross-time data, which can cover whole or partial life histories, are of interest not just from the point of view of how particular states (e. g. occupation, family situation or attitudes) alter between two or more observation points. In addition important questions relate to the duration of single states and their consecutive sequence.

The second problem results from the fact that states, occurrences and developments in different spheres of life must be inter-relatable, as far as possible, both in their duration and their sequence. Furthermore, these inter-relations cannot be regarded in isolation for particular individuals only, but, at least for certain phases of life, groups of individuals (married couples, families) form the units of analysis, and the model should ensure that the experiences of the individual members of these groups can be related one to another.

If we disregard the primarily Polish investigations based on the biographical method, and the mainly qualitative ethnomethodological studies on status passage, in mobility research we find at most approaches which are connected with the analysis of life histories<sup>13</sup>. However, by comparison to the program just outlined, these approaches are extremely modest. Basically, two research paradigms are present in mobility research<sup>14</sup>.

The first of these relates to the investigation of transitions between a set of positions within certain time intervals (e. g. transitions from educational levels to occupational positions or between occupational positions from one point of obser-

<sup>12</sup> Compare here: Clausen, John A., *The Life Course of Individuals*, in: Riley, Mathilda W., et al. (eds.), *Aging and Society*, New York 1972.

<sup>13</sup> E.g. Strauss, Anselm L., *The Context of Social Mobility. Ideology and Theory*, Chicago 1971.

<sup>14</sup> See Sørensen, Aage B., *Models of Social Mobility*. Report No. 98. The John Hopkins University, Baltimore 1971.

vation to another). In this analysis of transition matrices the simultaneous inclusion of several points of observation is doomed to rapid failure due to problems of sample size. If a somewhat differentiated classification of positions is used, this limit will quickly be reached when, for example, background, education and occupational position are examined in a transition matrix model<sup>15</sup>. If, moreover, a sufficiently differentiated description just of occupational careers is to be made, such a large number of transition matrices will be needed that clarity will inevitably be lost. The use of complex Markov chain models generally fails, due to the unrealistic assumption of constant transition probabilities irrespective of earlier moves<sup>16</sup>.

The second paradigm comprises regression analyses of the status attainment process. Here the number of considered variables can easily be increased. However, in the simple form of path analyses, as developed by Blau and Duncan<sup>17</sup>, this model has, along with statistical problems considerable theoretical limitations as pointed out primarily by Crowder<sup>18</sup>. In respect to both paradigms, Sørensen's contributions represent important steps forward<sup>19</sup>. Since, however, the approaches developed in mobility research are basically limited to the analysis of occupational careers, the problem of simultaneously taking into account events and developments in various other spheres of life remains unsolved.

A wholly different approach to the analysis of life courses is contained in the graphs first developed by Form and Miller also for the investigation of occupational careers<sup>20</sup>. Miller and Form drew graphs of the occupational careers of all respondents in a small sample within fairly rough occupational classifications, and illustrated from them the typology of various phases of working life (initial, trial, stable work period). In the last few years Carr-Hill and MacDonald and Lienard and Llewellyn have adopted this approach and, by developing EDP plot routines, have

<sup>15</sup> Müller, Walter, and Mayer, Karl Ulrich, *Chancengleichheit durch Bildung? Untersuchungen über den Zusammenhang von Ausbildungsabschlüssen und Berufsstatus* (Gutachten und Studien der Bildungskommission des Deutschen Bildungsrates, vol. 42), Stuttgart 1976.

<sup>16</sup> The use of Markov chain models for the study of mobility processes is discussed by McFarland, David D., *Substantive Contributions of Markov Models to the Study of Social Mobility*, University of Chicago 1974, mimeo.

<sup>17</sup> Blau, Peter M., and Duncan, Otis D., *The American Occupational Structure*, New York 1967.

<sup>18</sup> See Müller, Walter, *Familie, Schule, Beruf: Analysen zur sozialen Mobilität und Statuszuweisung in der Bundesrepublik*, Opladen 1975; and Müller, Walter, *Education and Class Structure in West-Germany* (SPES-Arbeitspapier Nr. 32), Frankfurt/Mannheim 1975; Crowder, David N., *A Critique of Duncan's Stratification Research*, in: *Sociology*, 8 (1974), pp. 19–45.

<sup>19</sup> Sørensen, Aage B., *A Model for Occupational Careers*, in: *American Journal of Sociology*, 80, 1 (1974), pp. 44–57; *Growth in Occupational Achievement. Social Mobility or Investments in Human Capital*, in: Land, Kenneth C., and Spilerman, Seymour (eds.), *Social Indicator Models*, New York 1975; *The Organization of Activities in Time*, in: *Demography*, 19 (Aug. 1975); *The Structure of Intragenerational Mobility*, in: Ziegler, Rolf (ed.), *Anwendung mathematischer Verfahren zur Analyse des Statuszuweisungsprozesses*, Kiel 1975.

<sup>20</sup> Form, William H., and Miller, Delbert C., *Occupational Career Pattern as a Sociological Instrument*, in: *American Journal of Sociology*, 54 (1948), pp. 317–329.

created the possibility of exploiting this procedure with much greater ease and variety<sup>21</sup>.

As against Form and Miller's hand-drawn graphs, sub-groups for single diagrams can not only be picked out at will and then compared very easily, but a great step forward is also represented by the fact that, apart from the occupational patterns which Miller and Form restricted themselves to, a large number of other relevant events in life histories can be considered. Lastly, linking with a data retrieval system makes it possible to standardize the life history of different individuals in relation to various events or temporal orientation points. Thus life histories can readily be plotted in historical time, i. e. according to the calendar years in which they occurred, on the one hand, but also according to the age of the individuals concerned, on the other. The standardization can also be carried out according to any other event considered relevant, for example, the year of entry into working life, or for women the year of marriage or birth of the first or last child. Depending on the underlying question posed, various aspects of life courses can thus be easily emphasized on the graphs.

In the following I shall present results of first attempts to plot life histories by means of such EDP plot programs and to utilize such graphs for analytical purposes. First of all, though, I shall describe briefly the data I will be using.

The data are taken from the microcensus supplement of the Federal Republic of Germany of April 1971 („Social and Occupational Mobility of the Population“). Going beyond the basic program of the annual microcensus of the Federal Statistical Office, various information on the social background of the respondents, their education, and particularly the course of their occupational career, was gathered for a selection of 1 % of the population. Furthermore, data are available on the year of marriage, the number of children according to age groups, and change of address between 1960 and 1971. The data on occupational careers relate to the occupational position and branch of the economy in the years 1939, 1950, 1960, and 1971. In addition, all changes in occupational position and branch of the economy are recorded for the time period from 1960 to 1971, so that — at least in so far as the data are correct — a year by year analysis of occupational careers can be undertaken for this period. Since all members of a selected household were questioned in the microcensus, information on all household members is in principle available and can be combined. In the following illustrations the starting population consists of men. If they were married and living together with their wives, their data was linked with that of their wives, so that the life courses of married couples could be plotted jointly.

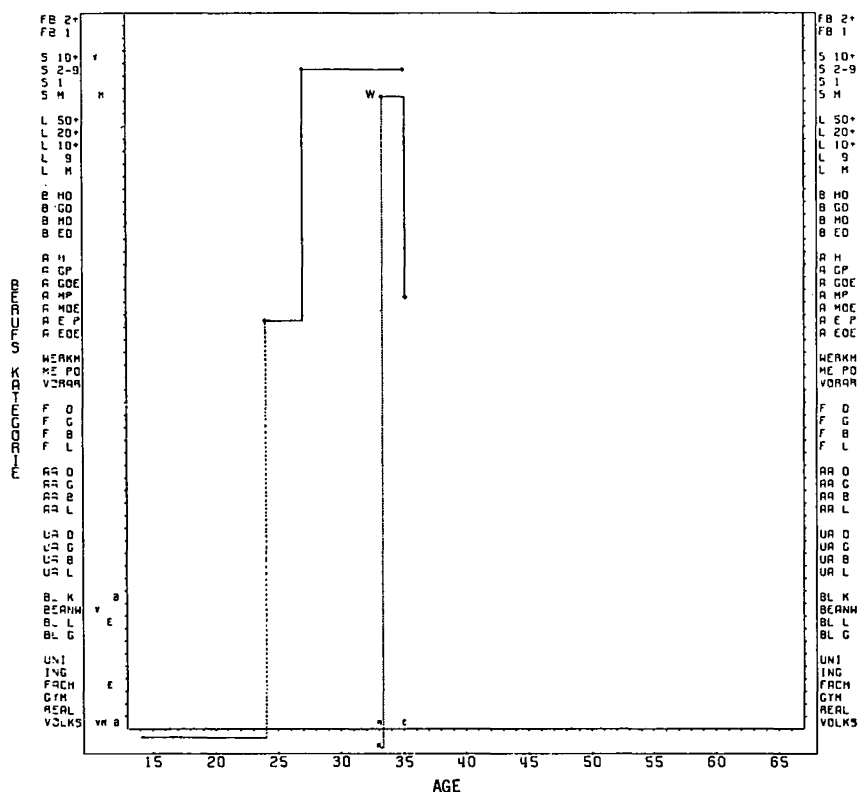
The present data were, of course, not collected from the standpoint from which they are now being analyzed. Therefore, substantial information which would have been useful for our analysis is missing. Thus we would, for example, have wished

<sup>21</sup> Carr-Hill, R. A., and MacDonald, K. I., Problems in the Analysis of Life Histories, in: Sociological Review Monograph, 19 (1973), pp. 57–95; Liénard, B. H. S., and Llewellyn, L. M., The Analysis of Life History Data Using Graphical Devices (no year), mimeo.

that the entire educational and occupational career were recorded in detail, or that information on the moment of exit from the parental household, on change of address, exact data on the time of birth of children, on phases of further education, illness, military service, imprisonment, etc., were available.

In the following presentation, we must take into consideration the limitations arising from the data material available to us. In particular, the illustrations can essentially refer only to occupational careers, since information on other spheres of life is insufficient or non-existent. However, it will become evident that we could easily make use of the procedure also for non-occupational information. Let us take an example to illustrate the nature of the graph (see Figure 1):

Figure 1: Example of a Single Life History Plot





The continuous horizontal lines within the framework of Figure 1 symbolize periods spent in different branches of the educational system or in occupational positions indicated by the labels outside the framework of the Figure (the meaning of the different labels is explained in Appendix 1). The vertical lines portray changes in these positions. Changes in occupational position (e. g. change of firm, so far as they are included in the data), which do not signify a change in the categories under consideration, are indicated by a rhomboid identification symbol on a horizontal line. Changes resulting in a state not included in the defined educational and occupational categories (e. g. no response, military service, illness, unemployment) are symbolized by dotted vertical lines and lead out of the inner framework. In the space between the two lower limits of the framework a symbol is inserted in these cases to signal the state in question. For the time being, the following symbols have been allotted:

- A = unemployed
- B = military service
- H = housewife
- K = no response

Keeping within the framework, further symbols can be situated on the lower horizontal axis. They represent the following events for the respective year:

- C = birth of a child
- D = divorce
- L = change of address
- M = marriage
- Q = exit from parental household

The first column of the graph can also contain symbols. They indicate what school education and occupational training the respondent (B), his wife (E), his father (V) and his mother (M) have. For the father and mother, their occupational position is also indicated.

Within the framework itself not only the career-line of the respondent is drawn, but from the moment of his marriage also that of his wife. For purpose of distinction, the wife's line is marked with a „W“.

Hence, Figure 1 relates the following life history of a respondent who was 35 years of age in 1971: The respondent comes from a family in which both parents have only primary school education. In addition, the father completed a civil service preparatory course, but then became self-employed and owned a business with more than 10 employees. The mother was occupied in the business as a co-working family member. The respondent similarly had only primary school education, but did a commercial apprenticeship. Up to the age of 23 there is no information on his occupational career. From the age of 24 to 27 he is a lower white-collar worker in the private sector. Then he sets up on his own and has a smaller firm with 2—9 employees. At 33 he marries a woman who has completed technical college and a household apprenticeship. At first his wife works in her husband's business as a co-

working family member and thereafter becomes a middle white collar worker in the private sector. She has a child in the same year. The respondent has lived in the same place since the age of 15.

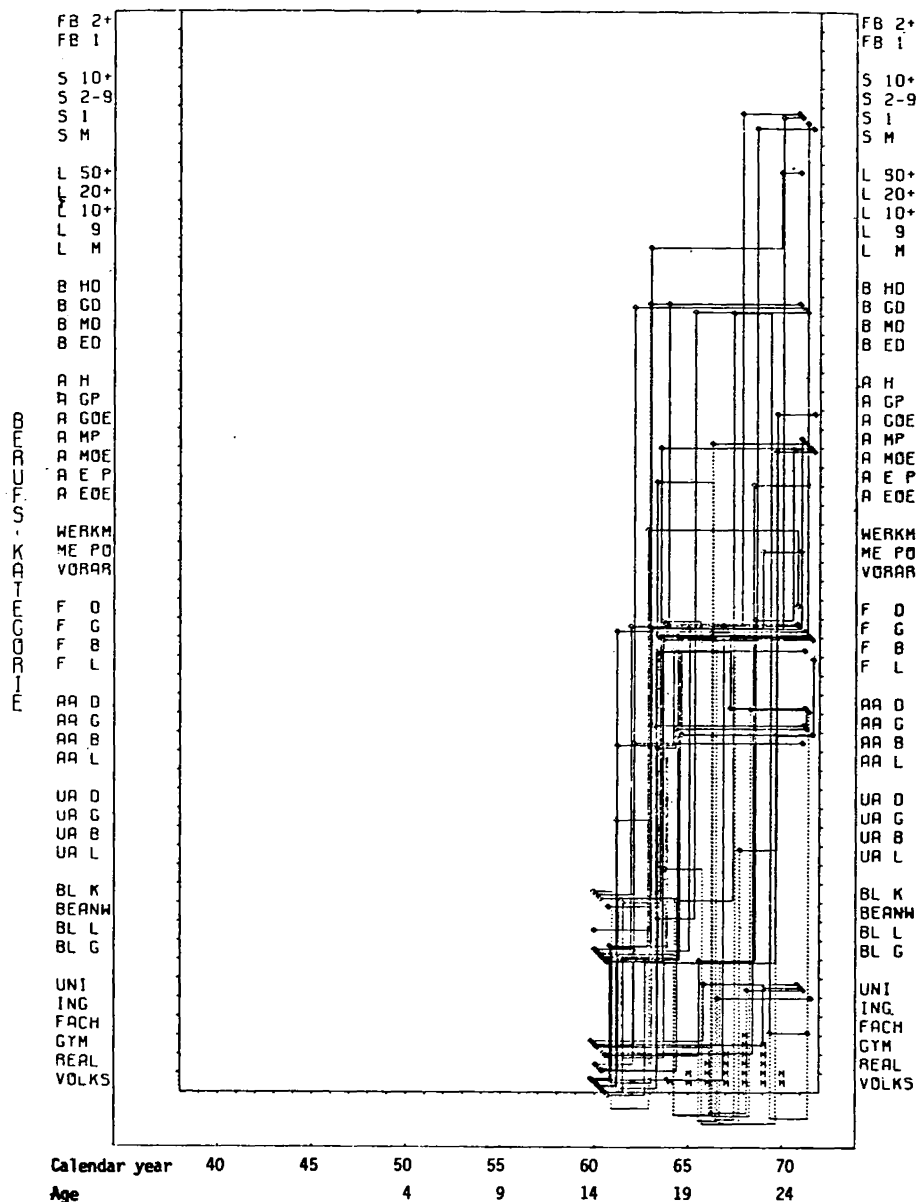
It would easily be possible to include other data in this kind of graph by means of symbols or another form of path curve, so that eventually numerous events and developments in a life history can be portrayed in time with relative economy of space and at a glance. In principle, there is no reason why subjective experiences and judgements, as long as they can be pinpointed in time, should not be included in this type of graph.

It would be difficult to compare large numbers of single life plots in order to illustrate and recognize certain structures of life courses. Therefore, the program provides the possibility of representing several life courses at the same time in one graph. The line for each successive person is set laterally a short distance away from the previous one, so different life course patterns can be distinguished. On the other hand the number of lines running parallel to each other express the quantitative importance of a given pattern and certain structural elements are emphasized on the graph in the form of thick bars.

Figures 2–5 each contain such multiple plots for birth cohorts of 10-year intervals. Each diagram contains the occupational careers of 40 men selected at random. For clarity the wife's career, data on the birth of children, change of address and background have been excluded. When looking through these diagrams, the structure of the available data must once again be recalled. Only for the period 1960 to 1971 are yearly data available. The previous years are represented by observations for the sample years 1939 and 1950 only. Therefore, mobility between the various occupational categories is also registered only for these points in time. Thus, for instance, the entire period 1950–1960 is represented by the situation in 1950 and in 1960 and only the most recent change is accounted for. Supposing, for example, a change took place in 1954, but in 1959 the person returned to the starting category of 1950, these two changes will not be registered here at all. This is, of course, extremely unsatisfactory. However, if this is a cause for objection it should be borne in mind that in traditional analyses of life course data (by means of transition matrices or regression analysis) as a general rule only information for particular sample years of fixed points of observation are taken into account. The problematic nature of such selective observations appears rather drastic here because they contrast with the yearly observations and portrayals during the period 1960–1971.

First of all let us consider the youngest cohort, members of which are 14–25 years of age in the period 1960–1971. This phase of life is marked by the transition from educational institutions to the occupational system. In the year 1960 a fair majority of the 14-year-olds is doing an industrial, trade or commercial apprenticeship. In the following year they are joined by a few more who in 1960 were still in primary school, and even later by a few secondary and upper school-leavers. The number of those embarking on a commercial apprenticeship is much lower than that for an industrial apprenticeship. Most gymnasium students stay at school until approximately the age of 20 and then go to university, some of them not until they

Figure 2: Occupational Life Histories of 40 Randomly Selected Men of Birth Cohort 1946



have done a few years military service. (The period of military service is portrayed by the broken lines running in the direction of the lowest part of the diagram.)

The first to take up an occupation are employed as unskilled or semi-skilled workers. Their number is at first fairly small, but later on they are joined by some who have completed an apprenticeship or worked previously as skilled workers. Almost all of those with a trade or an industrial apprenticeship — some after a break for military service — become skilled workers. Most of them are still skilled workers at 25. A few become white-collar workers in middle positions towards the end of the period of observation. But at least as many then carry out semi-skilled work. Only in odd cases do skilled workers rise to supervising positions or become self-employed before the age of 25. Little can be said here about the occupational future of commercial apprentices because the lines in this diagram cannot be clearly followed. At a later point I shall talk about a possibility of solving this descriptive problem.

Altogether — with the exception of the skilled worker area — the structure of Figure 2 is primarily vertical in character. This means that the respondents undergo many changes during the period of investigation. If we now compare the graph for the birth cohort 1946 with the diagrams of the older birth cohorts (1936, 1926, 1916), we notice that for the period 1960–1971 the structure of the graphs shifts more from the vertical to the horizontal. For the periods 1939–1950 and 1950–1960 the horizontal lines are in any case affected by the structure of the data, which, of course, register changes only for the sample years. With increasing age of respondents, however, vertical movements also decrease in the period 1960–1971, for which yearly observations are available. Hence the data clearly confirm the postulate of decreasing mobility rates with increasing age. Between the ages of 25 and 35 (see the last period in Figure 3) more cases of change take place than between the ages of 35 and 45 (see the corresponding period in Figure 4). Mobility decreases further between the ages of 45 and 55. However, the data also show that even after the age of 40 mobility processes do still occur. This is also true for workers, for whom — in all skepticism towards the classification employed — we observe both upward and downward mobility.

Finally a further interesting observation arises in the temporal pinpointing of the mobility processes observed between 1960 and 1971. If mobility processes in general were to decrease with age, most movements would be expected to take place at the beginning of the respective period of observation. But according to Figures 4 and 5 for the two older cohorts, more movements occur in the second half of the period 1960–1971, so that for further investigations the question arises, to what extent are effects of age linked with effects of historical periods<sup>22</sup>.

One problem with multiple plots is that the graphs become too complicated with larger numbers of people. If the number is too large, it is no longer possible to identify clearly to which observation year and category a particular point belongs. Since each subsequent line is placed minimally downwards and to the right of the previous one, the area provided for individual categories and observation years can be

<sup>22</sup> In more detail this problem is discussed in Müller, *Class Structure*.

Figure 3: Occupational Life Histories of 40 Randomly Selected Men of Birth Cohort 1936

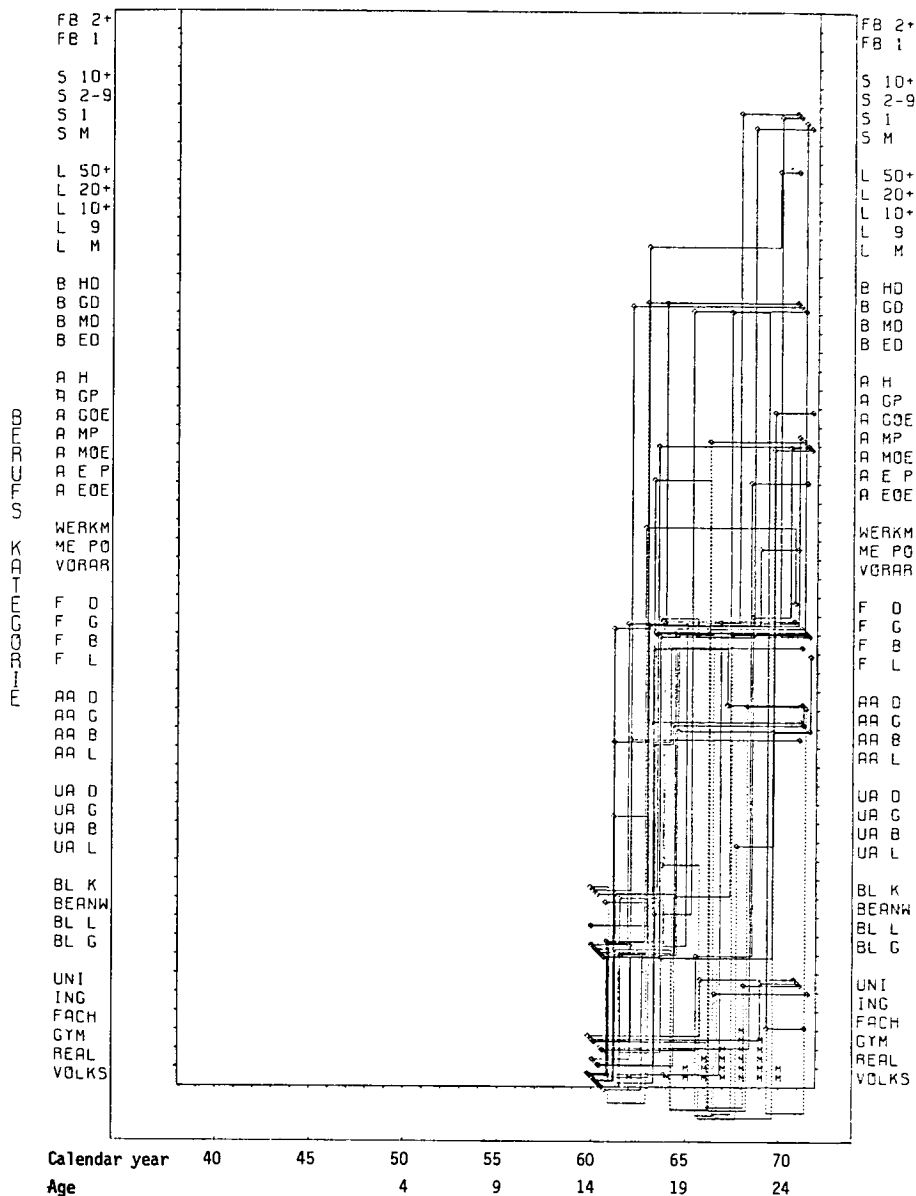


Figure 4: Occupational Life Histories of 40 Randomly Selected Men of Birth Cohort 1926

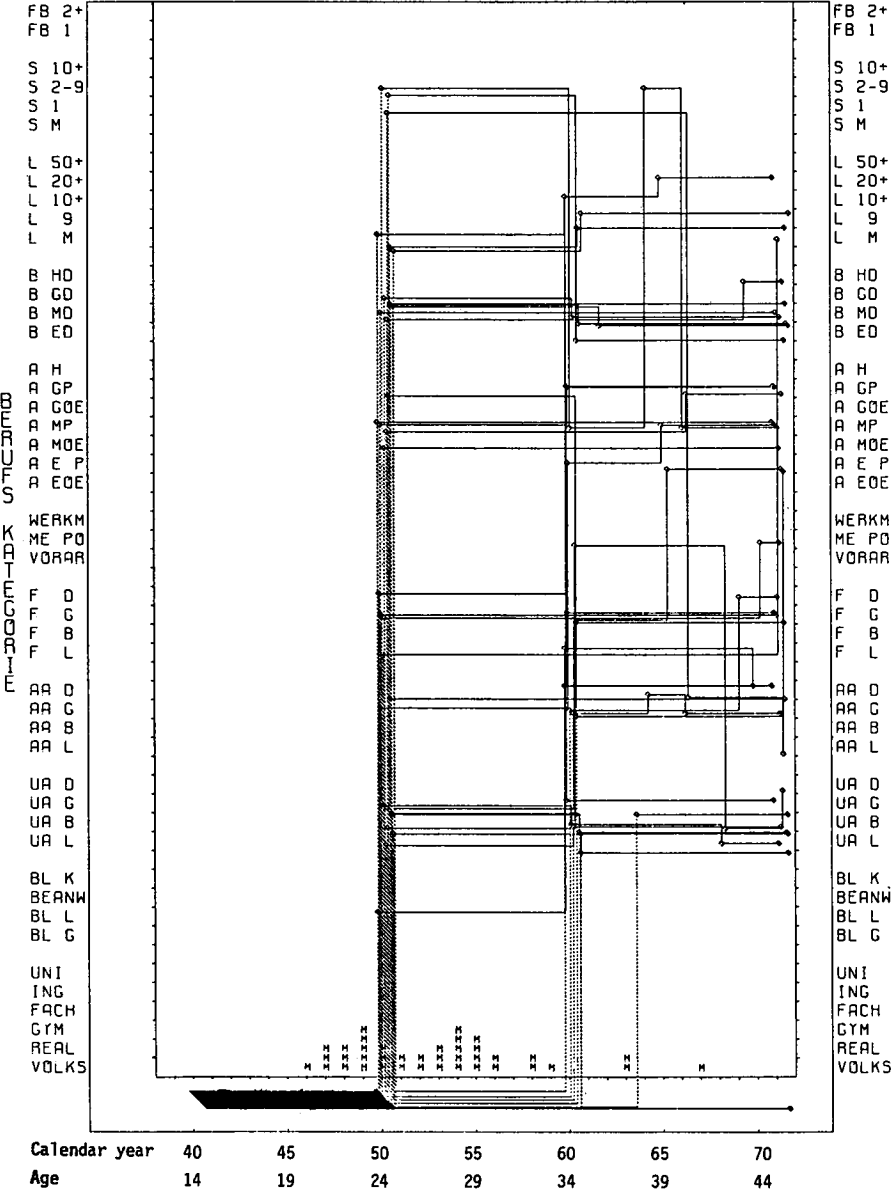
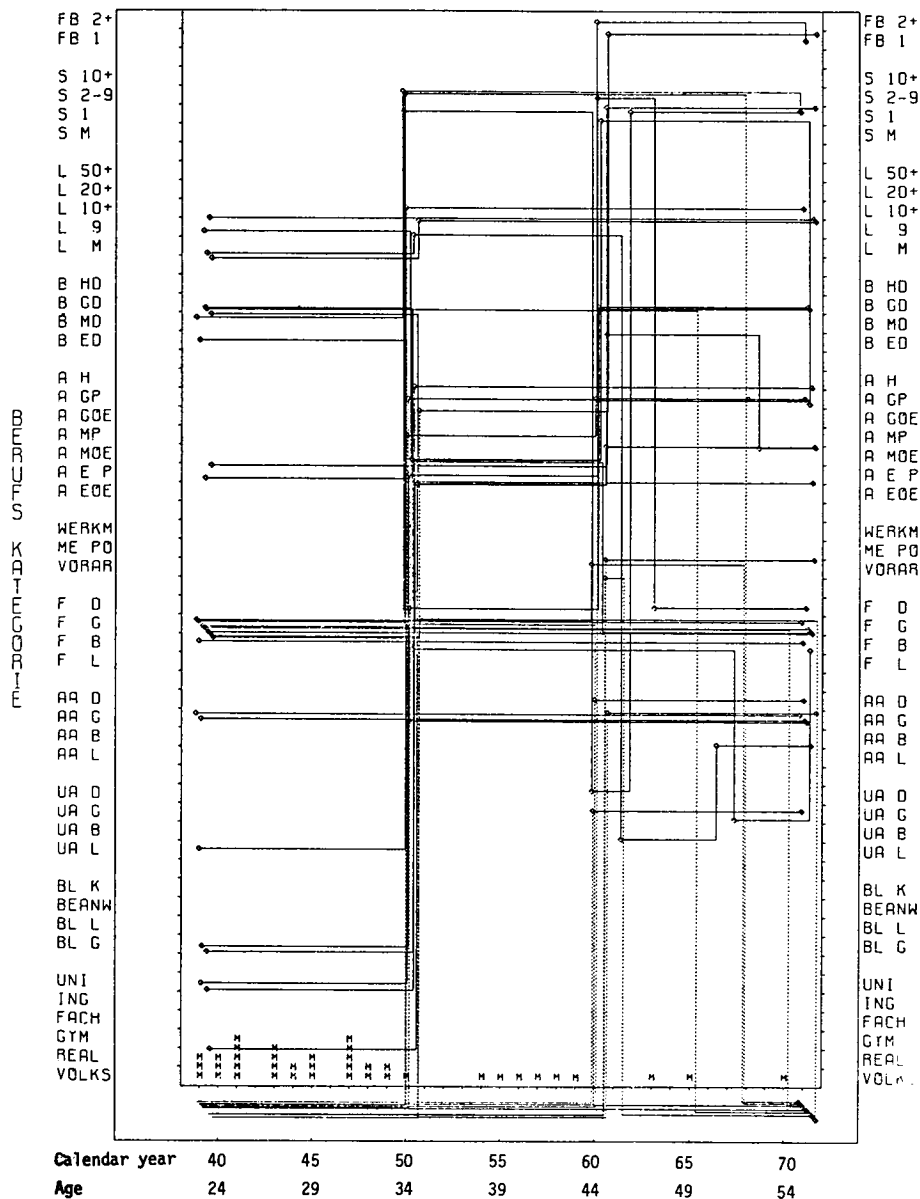


Figure 5: Occupational Life Histories of 40 Randomly Selected Men of Birth Cohort 1916



exceeded. Choosing a larger format is only a limited help. This is certainly a possible way out for the researcher during the course of his work, but it is hardly realistic from the point of view of publishing results. There remain, however, two other possibilities. First, the data can be divided up at random onto different plots by means of the split half procedure or even more subdivisions. This method is based on the principle of replication of results through mutually independent observations. The second method involves systematically selected observed cases according to theoretical criteria and portraying these various subgroups separately. By this means, the maximum possible number of persons can be portrayed for each sub-group and in this way the number of cases investigated increased. In combination with tabular classifications, the relative importance of sub-groups can be determined. The subdivision into birth cohorts employed previously was basically such a sub-group formation. But the sub-group formation model lends itself especially either to isolating out quantitatively important groups (typical cases) and examining them in more detail, or to forming sub-groups which, for theoretical reasons, one can expect to contrast. In the following I should like to give a few illustrations for both cases.

Quantitatively, the most significant groups in the transition from the educational to the occupational systems are those who have completed occupational apprenticeships. For the long-term occupational future, it makes a pronounced difference whether this was a trade-industrial or commercial apprenticeship. In Figures 6 and 7, 30 people with completed apprenticeships for each of the two types are compared. At the same time of observation all respondents were 35 years old. The phase of which yearly information is available relates to the respondent's age of 24–35. The first time of registration, the year 1950, happens to be their 14th year, at which point the majority of the future apprentices were still at school. Only one of the commercial apprentices but about one quarter of the industrial apprentices had already started their apprenticeship. The on average higher level of education among the commercial apprentices is also very apparent.

At 24 years of age a good fifth of the commercial apprentices were still white-collar workers in lower positions. But before their 30th year all except two had climbed to middle positions. From middle positions occupied by almost half of the respondents at 24 years of age, a few „descend“ to lower positions, a tendency which is countered later on. Otherwise, some climb to higher positions, so that at the end of the period of observation the proportions of middle and higher positions are balanced and amount to approximately one third. The career stability of the commercial apprentices who become civil servants is remarkable. Not only did no single person who became a civil servant between the ages of 24 and 35 lose that status — which is in itself hardly surprising — but not one of them even changed his career group in this time<sup>23</sup>.

Compared with the commercial apprentices, the occupational career of the industrial apprentices appears partly much more stable and partly much more

<sup>23</sup> The basis of observation is however very small. A special analysis with a sample of civil servants would be necessary here.



Figure 6: Occupational Life Histories of 30 Randomly Selected Men of Birth Cohort 1936 Which Have a Commercial Apprenticeship

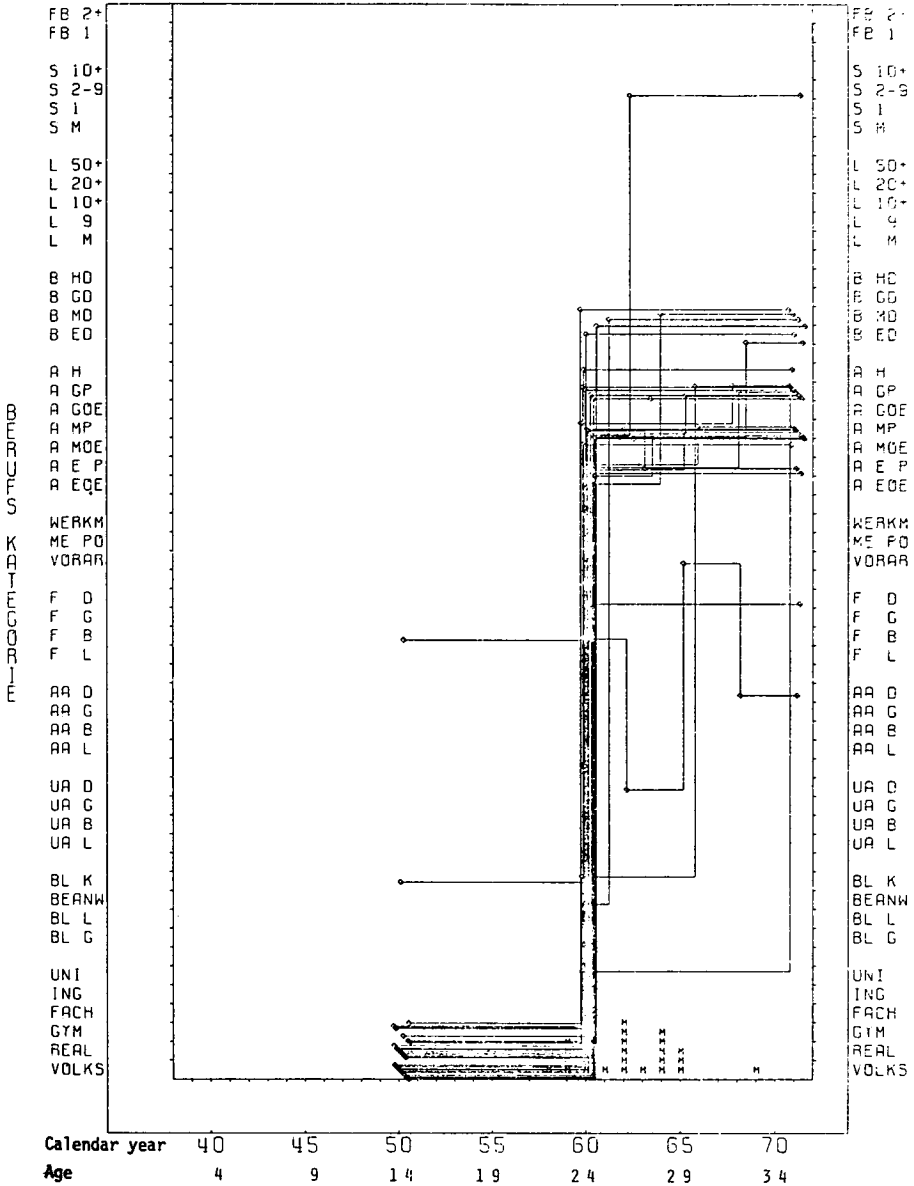
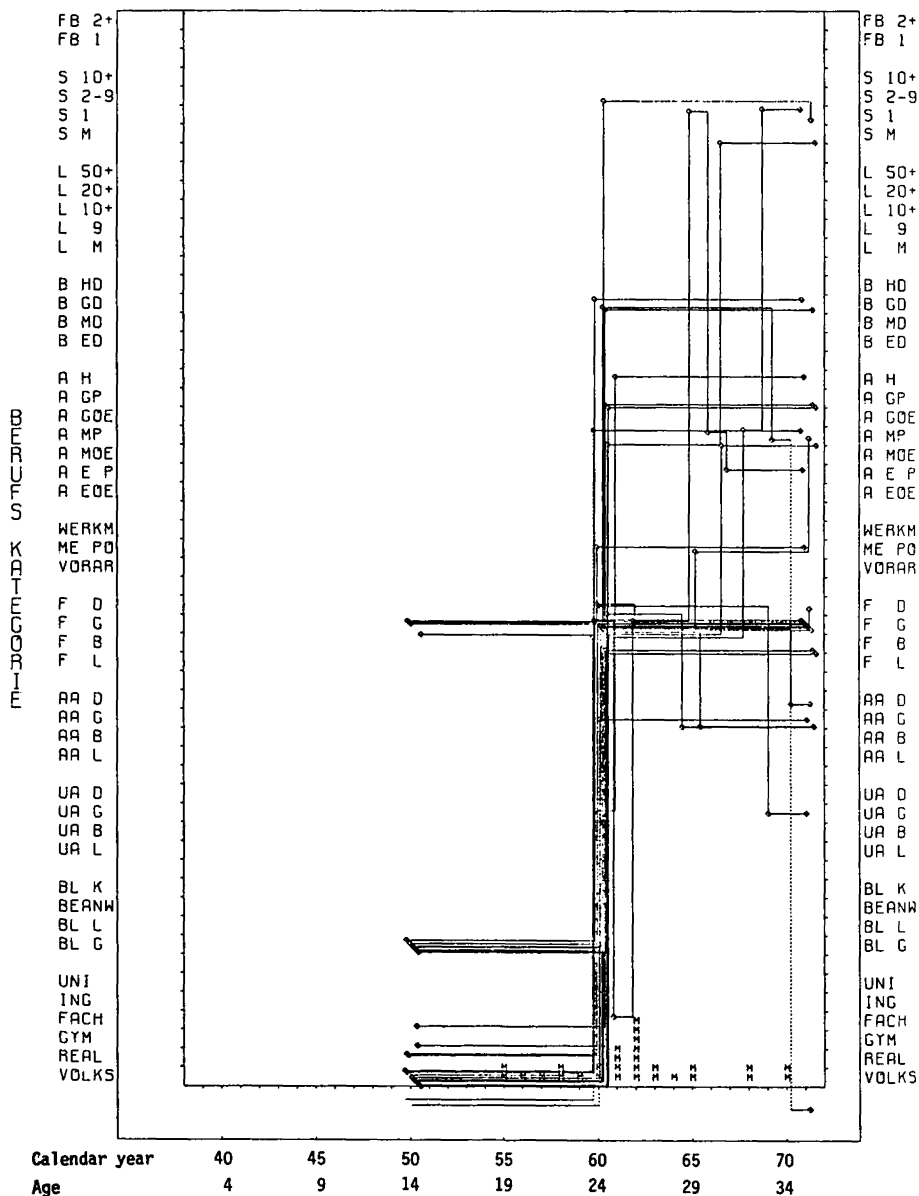


Figure 7: Occupational Life Histories of 30 Randomly Selected Men of Birth Cohort 1936 Which Have a Trade or Industrial Apprenticeship



uncertain. About half of all those included do not change their occupational position at all between the ages of 24 and 35. They remain skilled workers the whole time. However, of those who once changed from the position of skilled workers, none reverted back. This holds true both for those who transfer to semi-skilled or unskilled work and for those who attain supervisory positions, become white-collar workers, civil servants or self-employed. If differentiated data for the period from 1950 to 1960 were available, it would be possible to clarify to what extent former industrial apprentices, who are higher white-collar workers or civil servants in 1971, attained this climb through successive occupational improvements or through interim education such as at an engineering school or technical college. Higher civil servants have in any case probably taken the latter course because of the existing formal regulations regarding entry.

The career pattern of the trade and industrial apprentices differs also from that of the commercial apprentices in that irregular careers are no exception<sup>24</sup>. This is true not only of skilled workers who carry out less qualified work later on. An example of an irregular career is, for instance, the case of a skilled worker who goes into self-employment, a year later takes on a middle white-collar position and a year after that a lower white-collar position in which he remains. A further example is that of a skilled worker who becomes an upper-grade civil servant, then a white-collar worker in a middle position and finally unemployed.

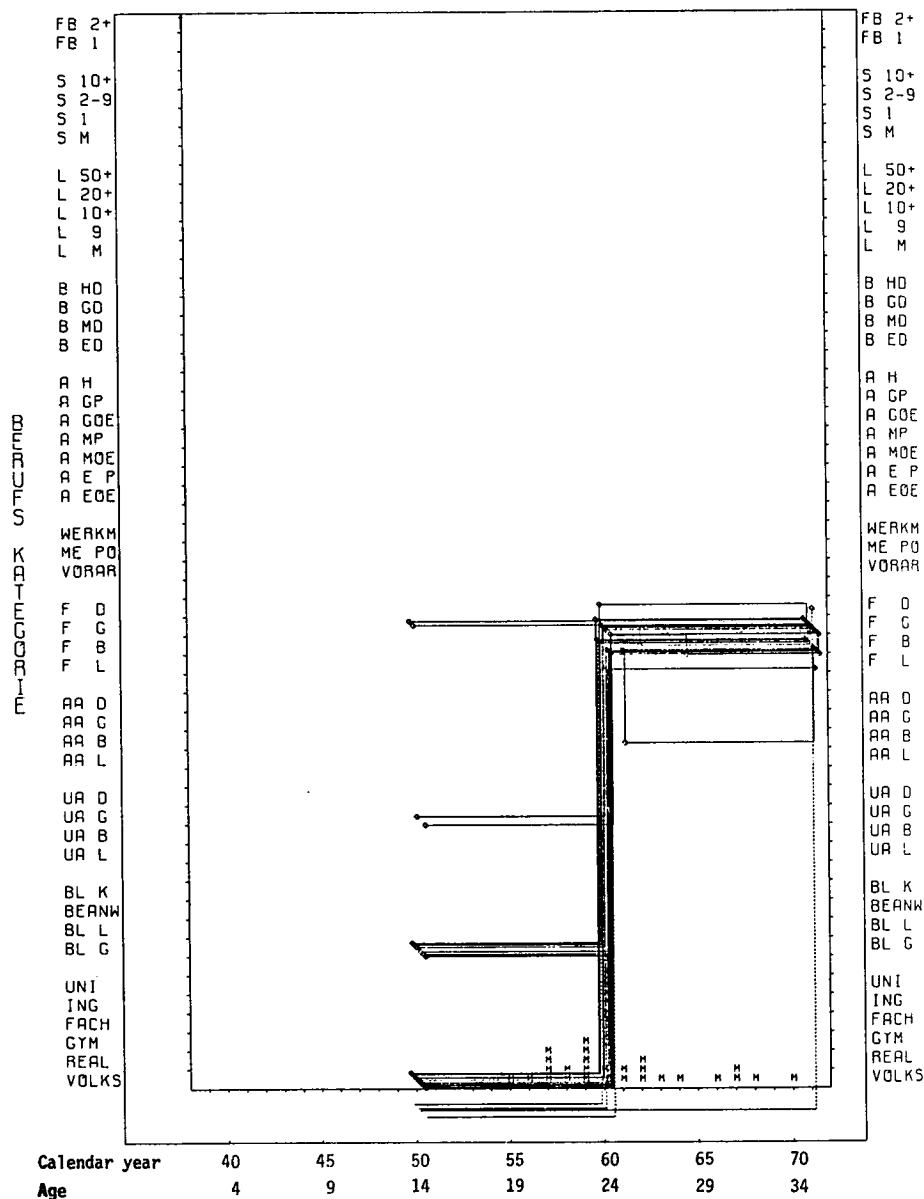
A further interesting difference between the groups relates to the extra-occupational sphere. The marriage age of the former industrial apprentices is much more scattered than that of the commercial apprentices. In principle it would be no problem to investigate the incidence of further extra-occupational events in the same way as for marriage, if data were available for them.

Sub-groups can thus be traced, as we have just seen, from a given starting point on into the future. But it is also justified to ask what kind of life path have those people had who have all attained a particular goal? In the following emphasis will be placed on this aspect of viewing life histories. Figure 8 shows the occupational past of a group of people picked at random, who at 35 years of age are all skilled workers. The result is very clear. Nearly all these skilled workers have worked in that capacity without interruption between the ages of 24 and 35. In all probability, only very few of them have had a break from skilled work before that — with the exception of time spent doing military service.

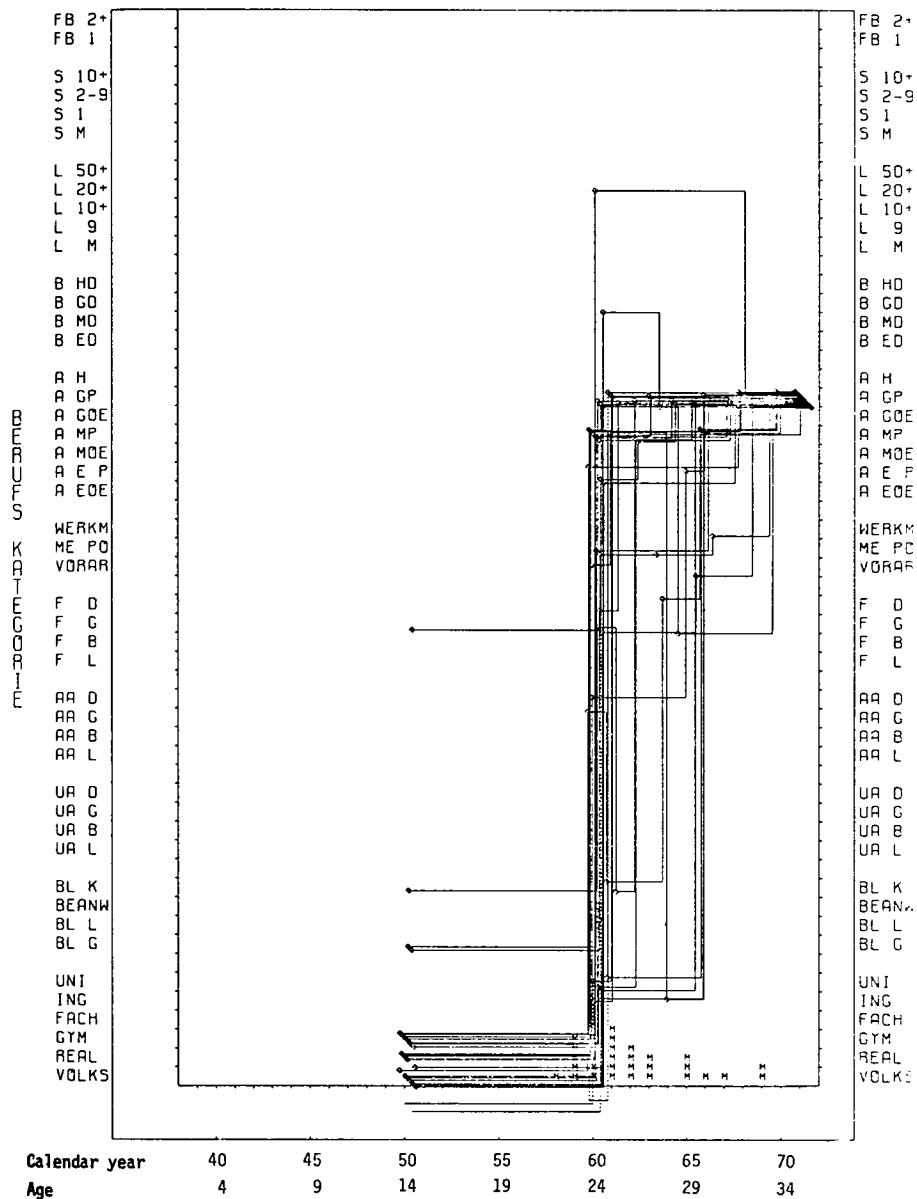
On the other hand — in order to pick out another group — completely different and much more heterogeneous is the occupational experience of those who at 35 years of age occupy higher white-collar positions (see Figure 9). Those who enter these positions directly from university and only have a few years working experience are to be found in this group. But the majority have attained these positions by means

<sup>24</sup> Wilensky, Harald L., *Orderly Careers and Social Participation: The Impact of Work History and Social Integration in the Middle Mass*, in: *American Sociological Review*, 26 (Aug. 1961), pp. 521–539;

**Figure 8: Occupational Life Histories of 30 Randomly Selected Men of Birth Cohort 1936 Who Are Skilled Workers at Age 35**



**Figure 9: Occupational Life Histories of 30 Randomly Selected Men of Birth Cohort 1936 Who Are Lower Managers at Age 35**



of successive occupational rises which resemble the rungs of a ladder. If lower and middle white-collar positions predominate among the previous positions held, occasionally even former unskilled workers make their way to higher white-collar positions via successive rises.

In a different context the hypothesis was suggested that these different access paths are closely linked with the social background of the future higher white-collar workers<sup>25</sup>. Middle class families make use of the educational system in order to guarantee a profitable occupational future for their children. When children from working class families manage to attain higher occupational positions, then this is more likely to occur via successive occupational rises. A test of this assumption is to be undertaken in Figures 10 and 11. In each Figure 30 men picked at random, all of whom occupied higher white-collar positions at 35, are contrasted. Those in Figure 10 come from working class families and those in Figure 11 from higher manager and civil servant families.

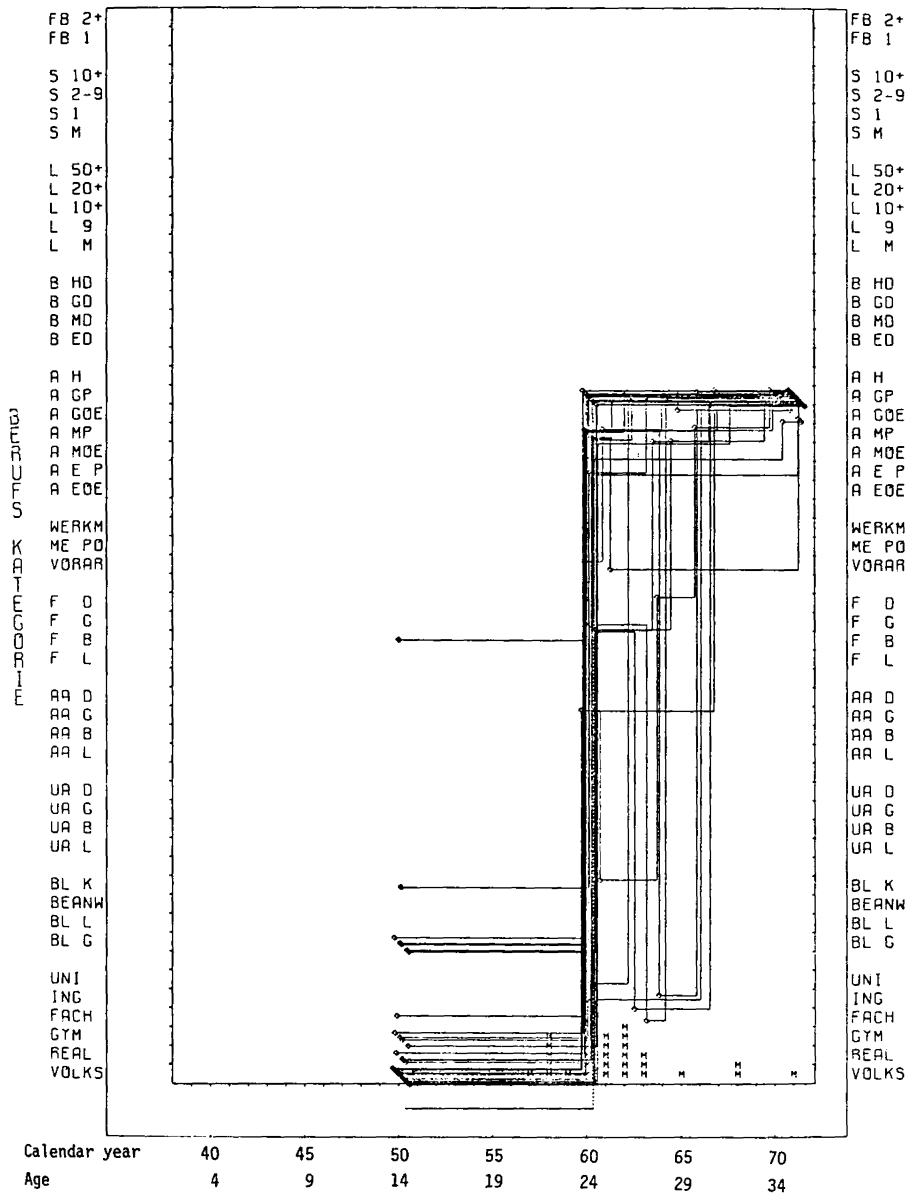
Even the distribution within the school system which these two groups of respondents display at the age of 14, shows marked differences. The children of workers are in the vast majority at primary school or doing an apprenticeship. Middle class children, on the other hand, are by a similar majority attending gymnasium, secondary school or technical college. Unfortunately, their further path of development up to the age of 24 cannot be traced in detail. But even the differences between the two groups which appear after that are clear enough. The majority of middle class sons already occupy higher positions or are still at university. From university most of them then transfer directly to higher occupations before the age of 30. Only about one quarter is working at 25 in lower or middle white-collar jobs and attains higher positions over the years. In contrast, only a small number of workers' sons of this age are already in higher positions or still at university. Most of them are in middle or lower jobs, are occupied both as white-collar and blue-collar workers and only move up into higher positions over the years. This is achieved partly through intermediate phases of training, particularly by attending technical and engineering colleges<sup>26</sup>. Altogether, the two diagrams document very clearly the influence of social background on the path of access to higher occupational positions.

As a final illustration of the possibilities of analysis of life patterns by means of graphs, we take reference to Figures 12 and 13. These diagrams relate to the wives of the men represented in Figures 10 and 11. Whereas previously the wives were excluded from the plot, now their husbands are excluded. Here, too, there are obvious differences between the two groups. First of all — and this is also visible in Figures 10 and 11 — the time of marriage in the group with working class husbands is earlier

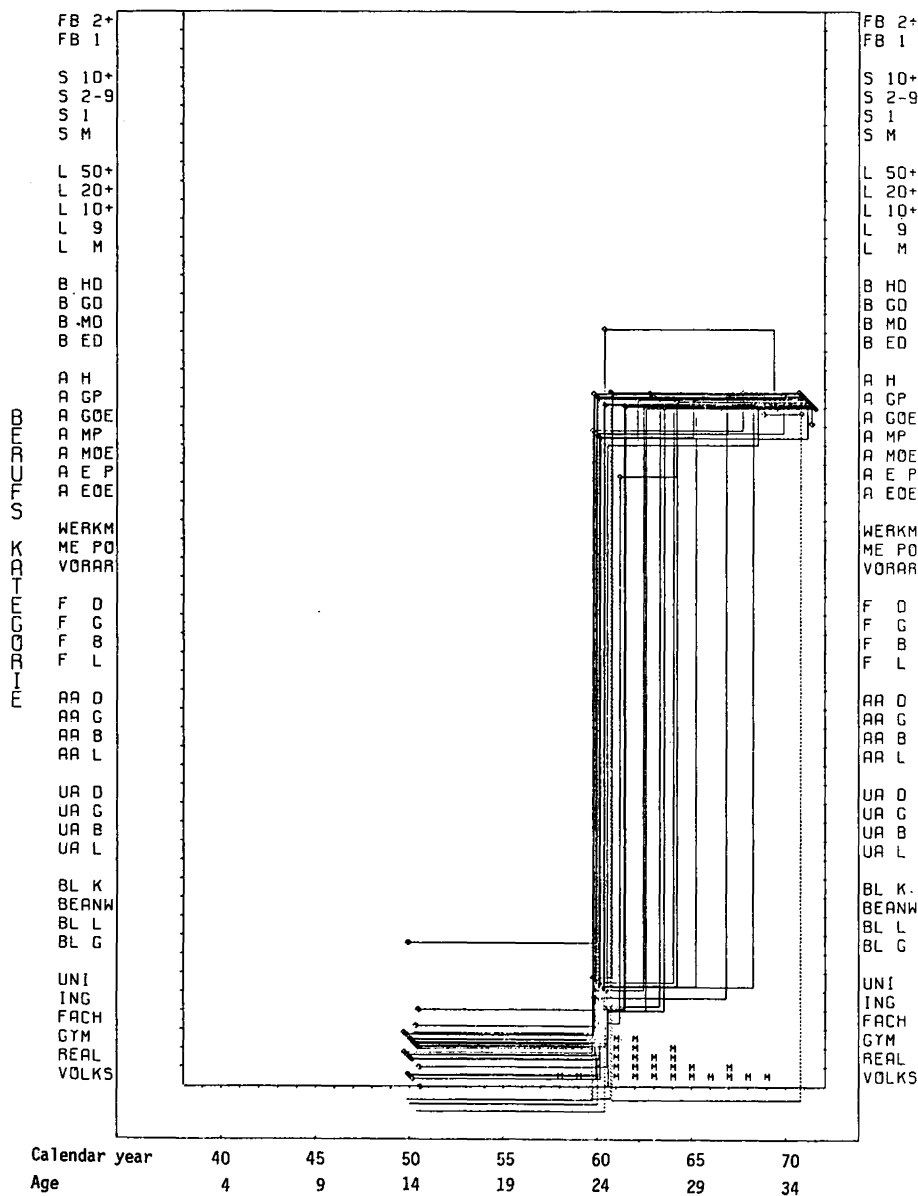
<sup>25</sup> Müller, Walter, *Klassenlagen und soziale Lagen in der Bundesrepublik*, in: Handl, Johann, et al., *Klassenlagen und Sozialstruktur. Empirische Untersuchungen für die Bundesrepublik Deutschland*, Frankfurt 1977.

<sup>26</sup> For the significance of this type of educational institution as a means of attaining higher positions, see also Lutz, B., and Kammerer, G., *Das Ende des graduierten Ingenieurs? Eine empirische Analyse unerwarteter Nebenfolgen der Bildungsexpansion*, Frankfurt 1975.

**Figure 10: Occupational Life Histories of 30 Randomly Selected Men of Birth Cohort 1936 Who Are Lower Managers at Age 35 and Whose Father Was a Worker**

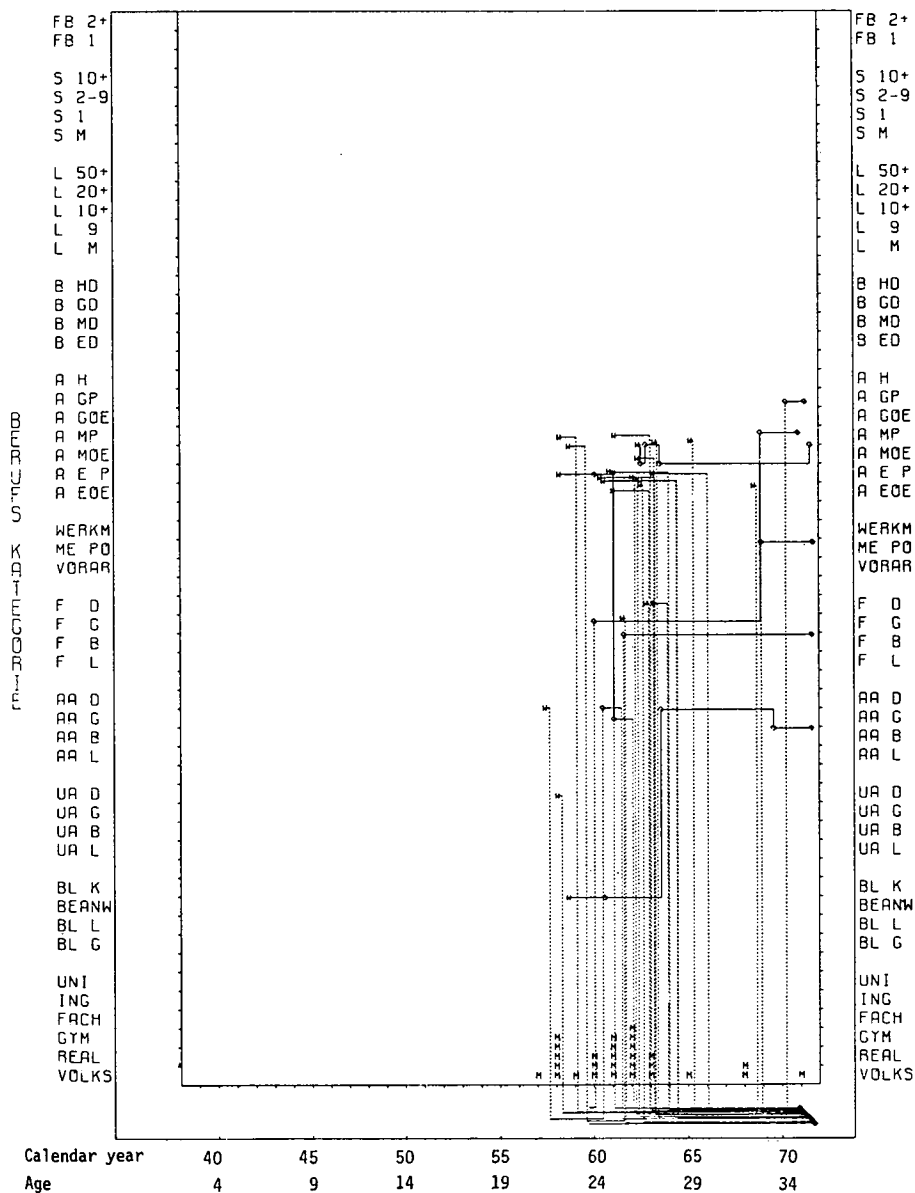


**Figure 11: Occupational Life Histories of 30 Randomly Selected Men of Birth Cohort 1936 Who Are Lower Managers at Age 35 and Whose Father Was a Lower or Top Manager or Upper High Trade Civil Servant**

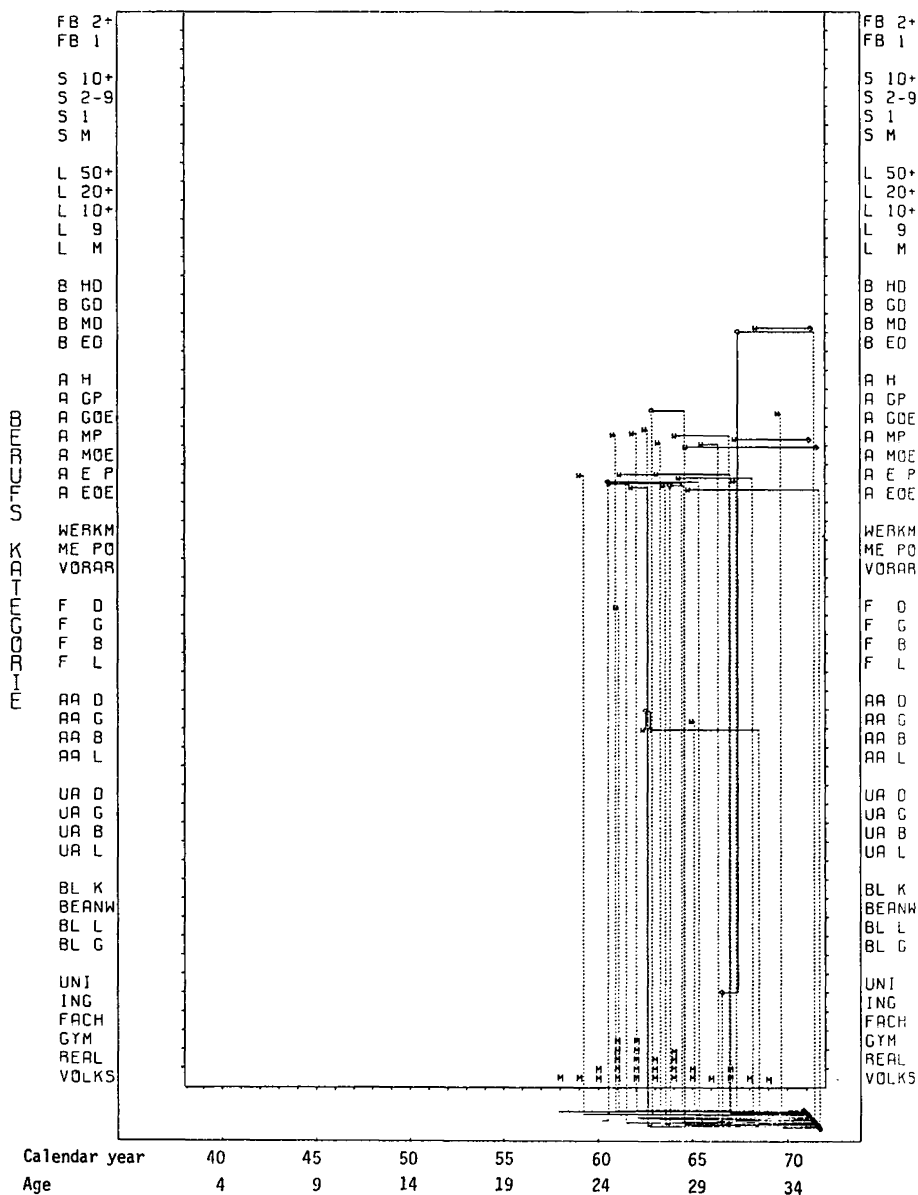




**Figure 12: Occupational Life Histories of the Wives of 30 Selected Men of Birth Cohort 1936 Who Are Lower Managers at Age 35 and Whose Father Was a Worker**



**Figure 13: Occupational Life Histories of the Wives of 30 Selected Men of Birth Cohort 1936 Who Are Lower Managers at Age 35 and Whose Father Was a Lower or Top Manager or Upper or High Trade Civil Servant**



than in the middle class group. This is certainly connected with the later entry into working life in the middle class group. Secondly, the occupation carried out by women of the middle class group before their marriage — marked by the symbol W on the graph — tends to be higher on the occupational scale than that carried out by wives of workers' sons. Thirdly, it can be noted that wives of men with middle class background give up their jobs more often after marriage than wives of men with working class background.

The various illustrations presented bring to light, in my opinion several advantages and disadvantages of this method. It must be seen as a disadvantage that the graphs become over-complicated with a large number of respondents and therefore a restriction to small sample sizes and all the ensuing problems of random results must be put up with. It will therefore be necessary to safeguard individual findings by the usual quantitative tests.

One great advantage is surely the clear illustration of complex patterns which is not matched by any of the other standard methods. This happens to be true in a situation in which there are good reasons for not using a one-dimensional occupational scale for the various occupational categories. The changes of occupational improvement of such different categories as blue-collar workers, white-collar workers, civil servants, farmers and the self-employed probably obey very different rules. The various fairly arbitrarily chosen examples have shown that the graph method presents good opportunities of detecting these rules. It is therefore, at least at the stage of forming hypotheses, a useful research instrument.

In order to analyze occupational and life course patterns, one will not get around sorting the multitude of different possibilities into simplifying typologies. For this it will be necessary to perform extremely complex indexing operations and data transformations. In this respect as well the method employed should be of great help; on the one hand, because it clearly reveals the structure of the data, and on the other, because by means of plot routines the homogeneity of the types formed can easily be checked.

Finally the problem of the temporal correlation of event in different life spheres can be elegantly solved with the aid of the plot methods presented here, whereas the standard methods hardly offer any attempts at a solution.

It is surely no coincidence that just the theme „life histories“ should take up so much space at a conference of sociologists and historians. On this topic, the particular talents and abilities of the historian in analyzing singular events and developments in a multitude of relations and influencing factors, coincides too closely with the sociologist's interest in subsuming the individual case as far as possible under general structures and regularities. Therefore, the question arises as to whether the method presented here could not be utilized also in historical research with a quantitative orientation. Particularly in historical research, I can imagine problems involving an analogous data structure. For instance, in a comparative analysis of the development of different states or of subunits of individual states it could be useful to portray the available information for each individual state in its historical sequence in the form of a graph. Selected developments could then be integrated in

a multiple plot for several states. Finally, it would be possible not to plot the information according to calendar years but according to its distance in time from a decisive basic year, thus for example, according to the interval from the foundation of the state, the introduction of universal suffrage or the introduction of the first social welfare legislation. With a small number of investigation units this could certainly to a limited extent be managed by hand. If, however, the number of analysis units and of investigation problems increases, the utilization of plot routines as illustrated here could also prove to be of benefit in this context.

*Appendix 1: Scheme of the educational and occupational classification*

FB 2+	freie Berufe über 1 Mitarbeiter	self-employed 1 or more employees
FB 1	freie Berufe bis 1 Mitarbeiter	self-employed 1 employee
S 10+	Selbständige über 9 Mitarbeiter	self-employed 9 or more employees
S 2–9	Selbständige 2–9 Mitarbeiter	self employed 2–9 employees
S 1	Selbständige 1 Mitarbeiter	self-employed 1 or 0 employee
S M	mithelfende Familienangehörige	coworking family members
L 50+	Landwirtschaft über 50 ha	farmers 50 or more ha
L 20+	Landwirtschaft über 20–49 ha	farmers 20–49 ha
L 10+	Landwirtschaft über 10–19 ha	farmers 10–19 ha
L 9	Landwirtschaft bis 9 ha	farmers 9 ha
L M	mithelfende Familienangehörige	coworking family members
B HD	höhere Beamte	civil servants, high grade
B GD	gehobene Beamte	civil servants, upper grade
B MD	mittlere Beamte	civil servants, middle grade
B ED	einfache Beamte	civil servants, lower grade
A H	höhere Angestellte	top managers
A GP	gehobene Angestellte	lower managers, private sector
A GÖ	gehobene Angestellte, öffentl. D.	lower managers, public sector
A MP	mittlere Angestellte, private W.	middle white collar, private sector
A MÖ	mittlere Angestellte, öffentl. D.	middle white collar, public sector
A EP	einfache Angestellte, priv. W.	lower white collar, private sector
A EÖ	einfache Angestellte, öffentl. D.	lower white collar, public sector
WERKM	Werkmeister	supervisors, industry
ME/PO	Meister/Poliere	manual supervisors
VORAR	Vorarbeiter	foremen

F D	Facharbeiter, Dienstleistung	skilled workers, services
F G	Facharbeiter, Gewerbe	skilled workers, industry
F B	Facharbeiter, Bau	skilled workers, construction
F L	Facharbeiter, Landwirtschaft	skilled workers, farm
AA D	angelernte Arbeiter, Dienstleistung	semi-skilled workers, services
AA G	angelernte Arbeiter, Gewerbe	semi-skilled workers, industry
AA B	angelernte Arbeiter, Bau	semi-skilled workers, construction
AA L	angelernte Arbeiter, Landwirtschaft	semi-skilled workers, farm
UA D	ungelernte Arbeiter, Dienstleistung	unskilled workers, services
UA G	ungelernte Arbeiter, Gewerbe	unskilled workers, industry
UA B	ungelernte Arbeiter, Bau	unskilled workers, construction
UA L	ungelernte Arbeiter, Landwirtschaft	unskilled workers, farm
BL K	kaufmännische Lehre	commercial apprenticeship
BEANW	Beamtenanwärter	civil service preparatory courses
BL L	landwirtschaftliche Lehre	farm apprenticeship
BL G	gewerbliche Lehre	trade or industrial apprenticeship
UNI	Universität	university
ING	Ingenieurschule	engineering school
FACH	Fachschule	technical or administrative college
GYM	Gymnasium	gymnasium
REAL	Realschule	lower grade secondary school
VOLKS	Volkschule	primary school